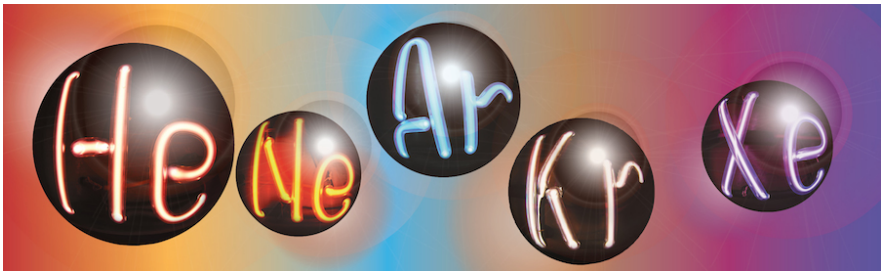

Contribution ID: **2** Type: **Presentation**

Lindhard integral equation with binding energy apply to light and charge yields nuclear recoils in noble liquid detectors

Thursday, September 22, 2022 9:00 AM (15 minutes)

We present a model for the ionization efficiency, or quenching factor, for low energy nuclear recoils based on a solution to Lindhard's integral equation with binding energy and apply it to the calculation of the relative scintillation efficiency and charge yield for noble liquid detectors. The quenching model incorporates a constant average binding energy together with an electronic stopping proportional to the ion velocity, and is essential input into an analysis of charge recombination processes to predict the ionization and scintillation yields. Our results are comparable to NEST simulations of LXe and LAr and are in good agreement with available data. These studies are relevant for current and future experiments using noble liquids as targets for neutrino physics and direct searches for dark matter.

Primary author: SARKIS, Youssef (Instituto de Ciencias Nucleares, UNAM)

Co-authors: Dr AGUILAR ARÉVALO, Alexis Armando (Instituto de Ciencias Nucleares); Dr D' OLIVO SAEZ, Juan Carlos (Instituto de Ciencias Nucleares)

Presenter: SARKIS, Youssef (Instituto de Ciencias Nucleares, UNAM)

Session Classification: Properties of noble liquids

Track Classification: Light/charge response in noble elements